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(54) Title: ANTIMICROBIAL ORAL COMPOSITIONS

(57) Abstract

An improved taste-masked antimicrobial oral composition and its method of preparation are disclosed. The composition comprises at least one bitter quaternary ammonium salt and at least one bitter essential oil, combined with a surfactant in a suitable carrier solvent such that the bitter-tasting components are effectively taste masked.

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ANTIMICROBIAL ORAL COMPOSITIONS

Field of The Invention

This invention relates generally to oral compositions such as mouthwashes, oral rinses, toothpastes and the like. More specifically, this invention relates to oral compositions comprising unpleasant, bitter tasting antimicrobial agents for the prevention of periodontal disease, gingivitis, plaque, bad breath and other associated oral problems wherein the unpleasant tasting antimicrobial agents are effectively taste masked.

Background of the Invention

It has been known for some time that the growth and development of microorganisms within the oral cavity are not only responsible for cavities but also malodorous breath, plaque, gingivitis, periodontal disease and gum disease. Numerous agents have been used in the past to fight growth and development of these microorganisms in the oral cavity and have been incorporated in various mouthwashes, oral rinses, tooth gels, powders and creams. These products have been commercially available for years. The antimicrobial agents used in these products include cetylpyridinium chloride (hereinafter "CPC") and other quaternary ammonium compounds, as well as the essential oils thymol, eucalyptol, menthol and methyl salicylate. CPC and thymol are unpleasant, bitter tasting. Their inclusion in oral compositions results in an unpleasant, bitter tasting composition which consumers reject.

Mouthwash and oral rinse compositions have been used for many years, and the art is replete with various formulations. Ordinarily, mouthwashes have been designed to clean the oral cavity, provide fresh breath, and kill harmful bacteria that contribute to oral malodor or secrete acidic residues which are harmful to teeth and aid in the development of gingivitis and periodontal disease. Plaque, for example, contains a number of pathogenic strains of

microorganisms which are a major cause of gingivitis, periodontal disease, and other gum infections. Plaque is also a precursor of calculus, the hard encrustation of calcium deposits and other debris which if left unchecked will cause further complications. Once developed, it can only be removed by strenuous and often painful scraping.

The reduction of harmful oral bacteria can be achieved by rinsing the oral cavity with a liquid composition containing antimicrobials to wash the tooth and gum surfaces for 15 seconds to over a minute. This rinsing may be done just prior to brushing using a pre-brush rinse, which chemically loosens and breaks up existing plaque or tartar which is then removed by the mechanical and abrasive action of brushing. Other oral rinse compositions are used after brushing. Antibacterial toothpaste can also help reduce oral bacteria.

Conventional mouthwashes typically comprise a water/alcohol carrier within which other components are dissolved or emulsified. These compositions generally contain ethyl alcohol ranging from about 0% to about 30% by volume of the total composition (hereinafter referred to as "% v/v"). This alcohol is used as a solvent in which water-insoluble ingredients, including antimicrobials as well as additives such as flavoring oils, color additives, fluorides and astringents, are dissolved and dispersed into an aqueous solution. Over 95% of the commercial mouthwash compositions available contain more than 15% by volume alcohol.

Water-insoluble essential oils including, but not limited to, thymol, menthol, methyl salicylate, and eucalyptol, as well as quaternary ammonium compounds such as CPC are used as antimicrobials in oral compositions. Unlike essential oils, quaternary ammonium compounds are water soluble. Like some essential oils, they taste bitter.

United States Patent No. 3,164,524 to Fund et. al. discloses oral antiseptic compositions comprising a

water/alcohol carrier containing menthol, methyl salicylate, thymol and eucalyptol. Additionally, these compositions contain benzoic acid, boric acid and chlorophenol derivatives. Although a highly effective antimicrobial mouthwash, these compositions are extremely bitter tasting and consumer compliance is not easily achieved.

U.S. Patent No. 4,945,087 to Talwar et. al. discloses an aqueous/alcohol mouthwash composition in which a sugar alcohol such as sorbitol or xylitol is used in combination with anethole to taste mask the bitter, biting astringent taste of the antimicrobial active, thymol. The composition assertedly masks the taste to such an extent that additional flavors or flavorants are not necessary but may be added if desired.

U.S. Patent No. 5,292,527 to Konopa claims a non-alcohol mouthwash comprised of a water insoluble flavor oil, and an effective amount of a dispersion system consisting of a non-ionic surfactant selected from either a hydrogenated castor oil or a polyoxyethylene polypropylene block copolymer having 50%-90% ethylene oxide, a humectant and an effective amount of one or more cationic antimicrobial agents. One such antimicrobial agent is a mixture of cetylpyridinium chloride and domiphen bromide.

U.S. Patent No. 5,236,699 to Libin claims an anti-plaque mouth rinse containing a combination of two antimicrobial agents, triclosan, and cetylpyridinium chloride. The two assertedly provide a coactive antimicrobial action thereby giving a superior oral hygiene regime. U.S. Patent No. 4,323,511 to Parran also discloses mouthwash compositions for plaque and calcium control comprising two active agents, a quaternary ammonium compound and a pyrophosphate salt. Cetylpyridinium chloride is listed as one of a number of the quaternary ammonium compounds and the actives are dissolved in a water-alcohol carrier using a pluronics emulsifier system at a pH of 7.0 to 9.5.

U.S. Patent Nos. 4,971,788 and 5,130,122 to Tabibi et. al. both disclose the use of a microemulsion system in oral mouthwashes and other dental products. Uniform, submicron-sized oil particles containing antimicrobials, antifungals, fluorides, preservatives, and a vast list of other active compounds derived from vegetable and animal oils are dispersed in an aqueous phase. Cetylpyridinium chloride is listed as a suitable emulsifying agent but not as an antimicrobial active. The oil droplets are proposed to do away with the unpleasant aspects of the bitter tasting actives.

Finally, U.S. Patent No. 4,590,061 to Southard discloses oral rinse compositions comprising a water/alcohol solution, an active comprising a sanguinarine chloride or sulfate salt, non-ionic and cationic synthetic detergents such as CPC, a humectant, flavors and sweeteners. The invention allegedly not only allows for the visual detection of plaque formation in the oral cavity but provides an antimicrobial active that is effective in reducing plaque colonies.

None of the aforementioned art, however, discloses an oral antimicrobial composition with quaternary ammonium compounds and essential oils that is formulated to effectively mask the bitter taste of the composition.

It is therefore an object of this invention to provide a pleasant tasting, effective antimicrobial oral composition for the elimination and prevention of plaque and its associated problems of gingivitis, periodontitis, gum disease and bad breath. It is a further object of the present invention to provide an effective antimicrobial oral composition containing a quaternary ammonium salt such as CPC, as well as essential oils, wherein the unpleasant, bitter, taste of the composition is masked to provide an effective plaque controlling solution or paste that will not deter consumer compliance. A further object of this invention is to provide a process for preparing an antimicrobial oral composition containing a quaternary

ammonium salt such as CPC, as well as essential oils, wherein the unpleasant, bitter taste of the composition is masked.

Summary of the Invention

The invention is directed to antimicrobial oral compositions for the prevention of plaque, gum disease, and oral malodor. More specifically the invention is directed to antimicrobial oral compositions comprising an effective amount of a bactericidal compound, essential oils and a non-ionic surfactant in a suitable carrier solvent wherein the unpleasant taste of the composition is masked. The invention is further directed to a method for preparing an antimicrobial oral composition for the prevention of plaque, gum disease, and oral maloder comprising an effective amount of a bactericidal compound, essential oils, and a non-ionic surfactant in a suitable carrier solvent wherein the unpleasant taste of the composition is masked.

Detailed Description of the Invention

This invention relates to oral compositions including, but not limited to, mouthwashes, oral rinses, pre-brushing rinses, toothpaste, toothpowder, and the like. The oral compositions of this invention are formulated to provide an antimicrobial composition for the prevention of plaque, gum disease, and oral malodor in which the unpleasant, bitter tasting antimicrobials are effectively taste-masked. The oral compositions of this invention incorporate effective amounts of antimicrobial agents dispersed in an aqueous/alcohol carrier with the use of non-ionic surfactants. The compositions of this invention are prepared by first combining in the alcohol phase one or more quaternary ammonium salts and one or more essential oils with a surfactant. The aqueous phase of the compositions, comprising water and water soluble components, is then combined with the alcohol phase. This

results in a composition wherein the unpleasant, bitter tasting antimicrobials are effectively taste masked.

The antimicrobial agents in this invention are quaternary ammonium salts and essential oils. These antimicrobial agents are the active ingredients, or actives, of this invention. Quaternary ammonium salts used in this invention are bacteriostatic in low concentrations and bactericidal in high concentrations. They are water and alcohol soluble, foam strongly when shaken, and are very bitter tasting. Quaternary ammonium salts that may be used in this invention include, but are not limited to, cetylpyridinium chloride, benzethonium chloride, benzalkonium chloride and domiphen bromide.

In a preferred embodiment of this invention, the quaternary ammonium salt that is used is cetylpyridinium chloride ($C_{21}H_{38}ClN$-H_2O), or CPC. CPC is the monohydrate of the quaternary salt of pyridine and cetyl chloride. Like other quaternary ammonium compounds, CPC is cationic, highly soluble in water and alcohol, and is an effective antibacterial agent. An effective antimicrobial oral rinse, mouthwash or toothpaste with CPC does not require high levels of alcohol to solubilize the CPC. CPC may be incorporated in the compositions of this invention in amounts of from approximately 0.01% to about 5.0% and preferably from about 0.03% to about 1.0% v/v and most preferably from about 0.05% to 0.15%.

CPC is readily perceived as bitter and metallic tasting. The unpleasant, bitter metallic taste of CPC discourages consumer use of compositions containing it. There is a need therefore to find a way to reduce the bitter, metallic taste of CPC, as well as that of any other quaternary ammonium salt that can be used in the compositions of this invention, without also reducing its efficacy and antimicrobial activity.

Essential oils provide additional antimicrobial antiseptic activity in the compositions of this invention. The essential oils in this invention include, but are not

limited to, thymol, methyl salicylate, eucalyptol, menthol and the like. These essential oils are generally incorporated in the mouthwash and toothpaste compositions of this invention in amounts of from about 0.005% v/v to about 3.0% v/v, preferably from about 0.02% to about 2.0%, and most preferably from about 0.1% to about 1.0%. Specifically, thymol is incorporated in an amount of from about 0.005% to about 3.0% v/v, preferably from about 0.01% to about 1.0% v/v, and most preferably from about 0.04% to about 0.15% w/v; menthol is incorporated in an amount of from about 0.005% to about 3.0% w/v, preferably from about 0.01% to about 1.0% w/v, and most preferably from about 0.04% to about 0.15% w/v; and methyl salicylate is incorporated in an amount of from about 0.005% to about 3.0% w/v, preferably from about 0.01% to about 1.0% w/v, and most preferably from about 0.04% to about 0.15% w/v. Anethole may also be incorporated into this composition of this invention in an amount of from about .005% w/v to about 3.0% w/v, preferably from about 0.005% to about 1.0%; and most preferably from about 0.01% to about 0.15% w/v.

Like quaternary ammonium salts, some essential oils have an unpleasant, bitter, taste. Thymol, for example, is unpleasant even when incorporated in small amounts. Unlike CPC, however, essential oils are water insoluble.

This invention further comprises an aqueous/alcohol carrier for the dissolution and dispersion of the active ingredients. The aqueous/alcohol carrier in this invention comprises generally from about 80-95% v/v of the total composition. Ethanol is generally the alcohol of choice and can be used in amounts of from about 0% to about 30% v/v, preferably from about 5% to about 26% v/v, and most preferably from about 15% to about 26% v/v.

This invention further comprises at least one non-ionic surfactant to aid in the dispersion of the active ingredients. Generally, suitable surfactants in oral rinse compositions are the water soluble salts of higher fatty acids and block copolymers. Surfactants, however, may

inhibit the bactericidal activity of many antimicrobial agents. The oral compositions of this invention are formulated such that the antimicrobial activity of the active ingredients is not inhibited.

In addition to dispersing the active ingredients in this invention, it is believed that by combining the active ingredients and at least one non-ionic surfactant in the alcohol phase of this invention before adding the water phase micelles are formed within which the active ingredients are believed to be encapsulated or sequestered.

Micelles are electrically charged colloidal particles that are generally organic in nature. They are often comprised of aggregates of large, polymer molecules that have a hydrophobic portion and a hydrophilic portion. The active ingredients in this invention are encapsulated within micelles, whereby the hydrophobic portion of the polymer points in towards the center of the micelle and the hydrophilic portion points outward. It is believed such encapsulation effectively taste masks unpleasant-tasting active ingredients in this composition. Additionally, the active ingredients remain in solution.

The surfactants of this invention include, but are not limited to, poly(oxyethylene)-poly(oxypropylene) block copolymers, known commercially as poloxamers. There is a wide variety of poloxamers with different molecular weights, reactive side chains and the like. These poloxamers form micelles that encapsulate the active ingredients as described above. The surfactant is incorporated in amounts of from about 0.01% to about 5.0% w/v, preferably from about 0.02% to about 2.0% w/v, and most preferably from about 0.05% to about 1.0% w/v. Suitable poloxamer surfactants useful in the practice of the present invention include,

105	188	237	334
108	215	238	335
124	217	284	338
184	234	288	407

185 235 333

In a preferred embodiment of this invention, poloxamer 407 is used. Poloxamer 407 tends to produce the best micellar formation.

Buffer systems are used and added to optimize the pH of this invention. This is accomplished generally through the addition of a weak acid and its salt or a weak base and its salt. Useful buffer systems have been found to be sodium benzoate and benzoic acid in amounts of from approximately 0.05% to about 1.5% w/v and sodium citrate and citric acid in amounts of from about 0.0025% to about 1.0% w/v. Buffers are incorporated in amounts that maintain the pH at levels of from approximately 3.0% to about 5.0%, more preferably from about 4.0% to about 4.5%.

Various flavor oils useful for making this invention more palatable may be employed according to taste. Flavor oils in this invention including, but not limited to, peppermint, spearmint, eugenol, citrus flavors and mixtures thereof all may be used in this invention. Flavor oils are present in amounts of from about 0.005% w/v to about 3.0% w/v; preferably from about 0.1% w/v to about 2.0%, and most preferably from about 0.1% to about 1.0%.

Co-solvents are generally needed to dissolve the flavor oils used in this invention, as they do not readily dissolve in water or ethanol alone. Polyhydric alcohols such as glycerin, and glycols such as propylene and polyethylene glycol are necessary to dissolve the flavor oils into the aqueous phase and thereby provide a clear, non-cloudy solution. These co-solvents, alone or in combination, are incorporated into the composition in an amount of from about 0.05% w/v to approximately 30% w/v, preferably from about 0.1% to about 20% w/v, and most preferably from about 0.5% to about 15% w/v.

Water and ethyl alcohol are the major constituents of this invention. Ethanol (95%) is used in amounts of from about 1.0% to about 30% w/v. After all the ingredients are mixed, the water is added in an amount sufficient to bring

the total volume up to 1.0 liters. Optionally, coloring agents may be added in amounts of from about 0.0008% to about 0.001%, again according to ones personal tastes.

The compositions of this invention are prepared such that the unpleasant, bitter tasting active ingredients are effectively taste masked. This is accomplished by adding to alcohol the following ingredients in the following order: surfactant, quaternary ammonium compound, one or more essential oils, one or more flavor oils, one or more weak acids, one or more co-solvents. The solution is constantly stirred during this process to assure proper mixing of the components. Sodium salts, sweeteners, and colors are dissolved separately in water, which is then added to the alcohol mixture and mixed well. Water is then added to q.s. and the pH adjusted to about 4.2 through the addition of acid or base to the final composition.

The following examples are provided to more fully describe and specifically set forth Applicants' invention. They are for illustrative purposes only. It is recognized that minor changes and alterations might be made that are not disclosed herein but which do not markedly alter the overall final product. It is to be understood that any and all such changes are considered to fall within the spirit and scope of the invention as recited by the claims that follow.

Example I

Mint Flavored Antimicrobial Mouthwash

The following ingredients were collected and are given in their respective amounts.

INGREDIENT	PERCENT *	AMOUNT PER LITER
1. Alcohol USP	25.3000	253.0000 ml.
2. Peppermint oil Redistil., Farwest Terpeneless VR	.0500	.5000 gm.
3. Methyl Salicylate NF	.0670	.670 gm.
4. Thymol NF	.1000	1.0000 gm.

5.	Menthol USP	.0680	.6800 gm.
6.	Propylene Glycol USP	10.0000	100.0000 gm.
7.	Cetylpyridinium Chloride NF	.1000	1.0000 gm.
8.	Poloxamer 407	.1000	1.0000 gm.
9.	Anethole NF	.0130	.1300 gm.
10.	Benzoic Acid USP	.1000	1.0000 gm.
11.	Sodium Saccharin (sprayed dried, FCC)	.0500	.5000 gm
12.	FD & C Blue No. 1	.0008	.0080 gm.
13.	FD & C Red No. 40 (Alura Red)	.00005	.0005 gm.
14.	Citric Acid, USP granular fine anhydrous	.1450	1.4500 gm.
15.	Glycerin USP Special	5.0000	50.0000 gm.
16.	Sodium Hydroxide	q.s.	q.s.
	105 w/v solution	q.s.	q.s.
17.	Hydrochloric Acid (10% w/v)	q.s.	q.s.
18.	Water Potable	q.s.	q.s.
19.	Oil of Anise NF	q.s.	q.s.
20.	Vanillin NF (Lignin)	q.s.	q.s.
21.	Eugenol USP	.0030	.0300 gm.
22.	Sodium Benzoate NF	.1000	1.0000 gm.
23.	Sodium Citrate Granular USP	.0050	.0500 gm.

* Percent alcohol is v/v; all other ingredients are w/v.

In one vessel the following ingredients are added to alcohol during continuous mixing in the following order: CPC, poloxamer 407, methyl salicylate, thymol, menthol, anethole, eugenol, peppermint oil, benzoic acid, and citric acid. To this alcohol phase glycerin and propylene glycol are added.

In a separate reaction vessel, sodium citrate, sodium benzoate, saccharin and FD & C dyes are dissolved in water. After thorough mixing, this water phase is added to the alcohol phase with continued mixing. Depending upon the resulting pH of the solution, the sodium hydroxide or hydrochloric acid was added to bring the pH of the system to approximately 4.0-4.4. Water is then added to bring the total volume to one liter.

The mouthwash thus produced had a minty, slightly sweet taste with a barely noticeable astringent bite from the actives. Effective in killing and controlling bacterial colonies in the oral cavity, the composition

lacks the bitter burning sensation that otherwise detracts from patient compliance.

Claims

What We Claim is:

1. An antimicrobial oral composition for the prevention of plaque, gum disease and oral malodor comprising an effective amount of at least one bactericidal compound, at least one essential oil, and a surfactant in a suitable carrier solvent wherein the unpleasant taste of said composition is taste masked.

2. The oral composition of claim 1 wherein said bactericidal compound is an organic quaternary ammonium salt.

3. The oral composition of claim 2 wherein said organic quaternary ammonium salt is cetylpyridinium chloride.

4. The oral composition of claim 3 wherein said essential oils are selected from the group consisting of thymol, menthol, eucalyptol, methyl salicylate and mixtures thereof.

5. The oral composition of claim 4 wherein said surfactant is selected from the group consisting of poly(oxyethylene)-poly(oxypropylene) block copolymers.

6. The oral composition of claim 5 wherein said poly(oxyethylene)-poly(oxypropylene) block copolymer is poloxamer 407.

7. The oral composition of claim 6 wherein said carrier solvent consists of a water and alcohol mixture.

8. The oral composition of claim 7 further comprising at least one co-solvent selected from the group comprising polyhydric alcohols and glycols.

9. The oral composition of claim 8 wherein said co-solvent is selected from the group consisting of polyethylene glycols, propylene glycols, glycerin and mixtures thereof.

10. The oral composition of claim 9 wherein said cetyl pyridinium chloride is incorporated in an amount of from 0.01% w/v to about 5.0% w/v.

11. The oral composition of claim 10 wherein said surfactant is incorporated in an amount of from about .01% w/v to about 5.0% w/v.

12. The oral composition of claim 11 wherein said thymol is incorporated into said composition in an amount of from about .005% w/v to about 3.0% w/v.

13. The oral composition of claim 12 wherein said eucalyptol is incorporated into said composition in an amount of from about .005% w/v to about 3.0% w/v weight percent.

14. The oral composition of claim 13 wherein said menthol is incorporated into said composition in an amount of from about .005% w/v to about 3.0% w/v weight percent.

15. The oral composition of claim 14 wherein said methyl salicylate is incorporated into said composition in an amount of from about .005% w/v to about 3.0% w/v weight percent.

16. The oral composition of claim 15 wherein said anethole is incorporated into said composition in an amount of from about .005% w/v to about 3.0% w/v weight percent.

17. The oral composition of claim 16 wherein said alcohol comprises from about 0% v/v to about 30% v/v of the carrier solvent.

18. The oral composition of claim 17 wherein said co-solvent comprises from about 0.05% w/v to about 30% w/v.

19. The oral composition of claim 18 further comprising flavor agents, sweeteners, color additives, fluorides, astringents and mixtures thereof.

20. The oral composition of claim 19 selected from the group consisting of a mouthwash, a toothpaste, and a pre-brush rinse.

21. A method for the preparation of an effective antimicrobial mouthwash for the prevention of plaque, gingivitis, gum disease and breath malodor comprising mixing at least one organic quaternary ammonium salt together with at least one essential oil in a surfactant to create micelles and dispersing said micelles in a water-alcohol carrier solvent wherein the unpleasant taste of said mouthwash is effectively taste masked.

22. A method for the preparation of an effective antimicrobial mouthwash for the prevention of plaque, gingivitis, gum disease, and breath malodor wherein the unpleasant taste of said composition is taste masked, comprising:

a) mixing at least one non-ionic surfactant with alcohol,

b) adding at least one antimicrobial compound to said mixture,

c) adding at least one essential oil to said mixture,

d) adding flavors and flavor oils to said mixture,

e) adding at least one weak acid to said mixture

f) adding at least one co-solvent to said mixture,

g) subsequently adding an aqueous phase comprising water, food colors, sweeteners, salts of said additional buffers, and other water soluble excipients wherein the unpleasant taste of said oral composition is taste masked.

h) adjusting the pH of said mixture through the addition of a buffer, to provide an oral composition,

23. The method of claim 22 where said antimicrobial compound is an organic quaternary ammonium salt.

24. The method of claim 23 wherein said salt is cetylpyridinium chloride.

25. The method of claim 24 wherein said essential oil is selected from the group comprising thymol, anethole, eucalyptol, methyl salicylate, menthol and mixtures thereof,

26. The method of claim 25 wherein said surfactant is selected from the group consisting of poly(oxyethylene)-poly(oxypropylene) block copolymers.

27. The method of claim 26 wherein said poly(oxyethylene)-poly(oxypropylene) block copolymer is poloxamer 407.

28. The method of claim 27 further comprising the addition of a co-solvent.

29. The method of the claim 28 wherein said co-solvent is selected from the group consisting of polyhydric alcohols and glycols.

30. The method of claim 29 wherein said cetylpyridinium chloride is incorporated into said composition in an amount of from approximately 0.01% w/v to about 5.0% w/v.

31. The method of claim 30 wherein said essential one or more oils are incorporated into said composition in an amount of from about 0.005% w/v to about 3.0% w/v.

32. The method of claim 31 wherein said surfactant is incorporated in amounts of from about 0.01% w/v to about 5.0% w/v.

33. The method of claim 32 wherein said ethanol comprises from about 0% v/v to about 30% v/v of the composition.

34. A method for the preparation of an effective antimicrobial mouthwash for the prevention of plaque, gingivitis, gum disease, and breath malodor comprising the mixing of an antibacterial compound, a surfactant and at least one essential oil in alcohol followed by incorporation of an aqueous phase containing water soluble excipients wherein the unpleasant taste of said mouthwash is taste masked.

35. An effective antimicrobial mouthwash for the prevention of plaque, gingivitis, gum disease, and oral malodor composition wherein the unpleasant taste of said composition is taste masked, prepared by the process comprising:

a) mixing at least one non-ionic surfactant with alcohol,

b) adding at least one antimicrobial compound to said mixture,

c) adding at least one essential oil to said mixture,

d) adding flavors and flavor oils to said mixture,

e) adding at least one weak acid to said mixture

f) adding at least one co-solvent to said mixture,

g) subsequently adding an aqueous phase comprising water, food colors, sweeteners, salts of said at least one weak acid, and other water soluble excipients wherein the unpleasant taste of said oral composition is taste masked.

h) adjusting the pH of said mixture through the addition of a buffer, to provide an oral composition,

36. The mouthwash of claim 35 wherein said quaternary ammonium salt is cetylpyridinium chloride.

37. The mouthwash of claim 36 wherein said surfactant is selected from the group consisting of poly(oxyethylene)-poly(oxypropylene) block copolymers.

38. The mouthwash of claim 37 wherein said poly(oxyethylene)-poly(oxypropylene) block copolymer is poloxamer 407.

39. The mouthwash of claim 38 wherein said essential oil is selected from the group consisting of thymol, eucalyptol, methyl salicylate, anethole, menthol and mixtures thereof.

INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 95/12850

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61K7/22 A61K7/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,94 18939 (WARNERT-LAMBERT COMPANY) 1 September 1994 see table 2 ---	1-15, 17-20
X	FR,A,2 106 394 (COLGATE-PALMOLIVE COMPANY) 5 May 1972 see the whole document ---	1-15, 17-20
X	US,A,4 574 081 (SHYMON) 4 March 1986 see the whole document ---	1-4,8-20
X	FR,A,2 440 189 (UNILEVER) 30 May 1980 see the whole document ---	1,4-9, 11-20
E	WO,A,95 34277 (PROCTER & GAMBLE COMPANY) 21 December 1995 see the whole document ---	1-20
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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1

Date of the actual completion of the international search	Date of mailing of the international search report
7 February 1996	23.02.96
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016	**Authorized officer** Fischer, J.P.

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